

# Rocket City Weather

National Weather Service, Huntsville, AL

VOLUME I, ISSUE II

FALL 2010

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## Fall Severe Weather Season: Are *YOU* Ready?

*Krissy Scotten, Forecaster*

As each day goes by on the calendar, many of us are looking forward to a break in the summer heat with the cooler weather approaching soon. However, the changing of the seasons brings the typical clash of the airmasses across the Tennessee Valley. Although we may be looking forward to that first cold front in late September or early October, it's the airmass clashes that occur in November and December (and sometimes even mid to late October) that make up the Fall Severe Weather Season across the Southeastern United States.

Several destructive and deadly tornadoes have devastated Alabama and Tennessee

communities during the Fall Severe Weather Season over the past decade. In fact, during the October-December Fall Severe Weather Season, tornadoes in the Tennessee Valley have occurred in 8 of the last 10 years. Many of these tornadoes occurred after sunset, including the most well known Fall Severe Weather Season Tornado around these parts: The Huntsville Tornado of 1989. Nighttime tornadoes are extremely dangerous as it's very difficult to see them coming. The state of Alabama experiences 36.1% of tornadoes during the night while Tennessee is at almost half!

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## The Rocket City Weather Fest

*Sandy LaCorte, Forecaster*

*Attention kids and adults of all ages!* Are you fascinated by the weather? Do you want to become a meteorologist? Are you curious about how our atmosphere works? If so, then Rocket City Weather Fest is where you'll want to be on Saturday, October 16, 2010. From 10:00am to 2:00pm at the Shelby Center located on the UAHuntsville campus (near the intersection of Sparkman Drive and Holmes Avenue) the University

of Alabama in Huntsville Student Chapter of the American Meteorological Society (UAHuntsville AMS) will host Rocket City Weather Fest, a free admission Weather Festival for the Northern Alabama community. With the support of the University of Alabama in Huntsville Atmospheric Science Department, the NWS in Huntsville, the Short-term Prediction

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# Fall Severe Weather Season

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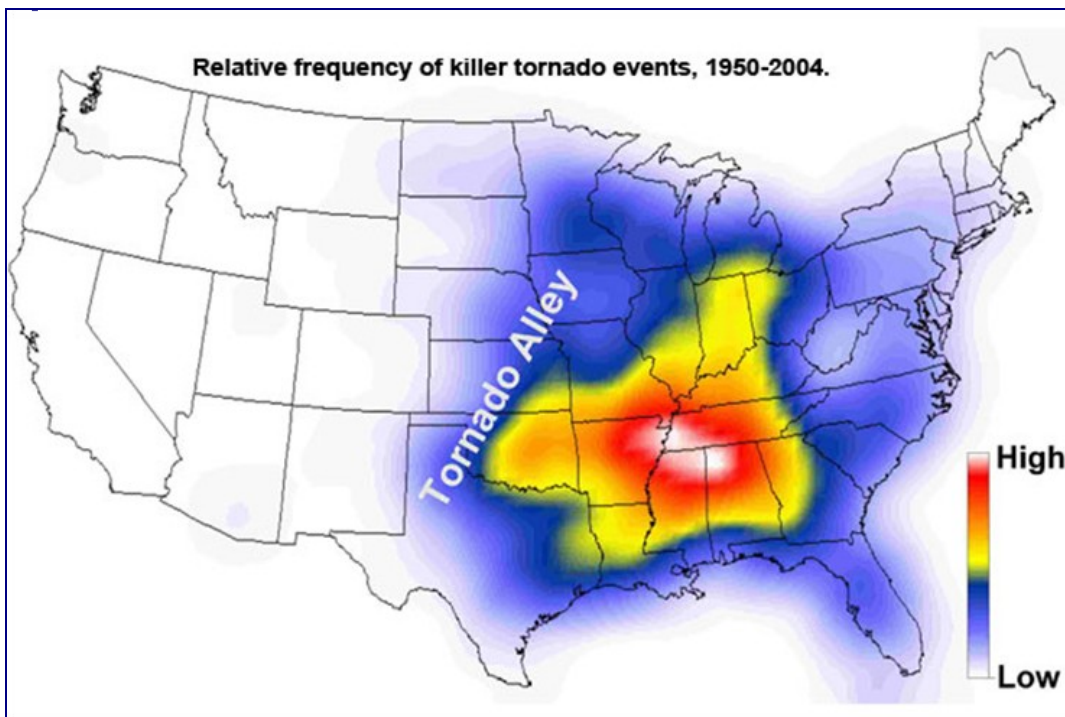
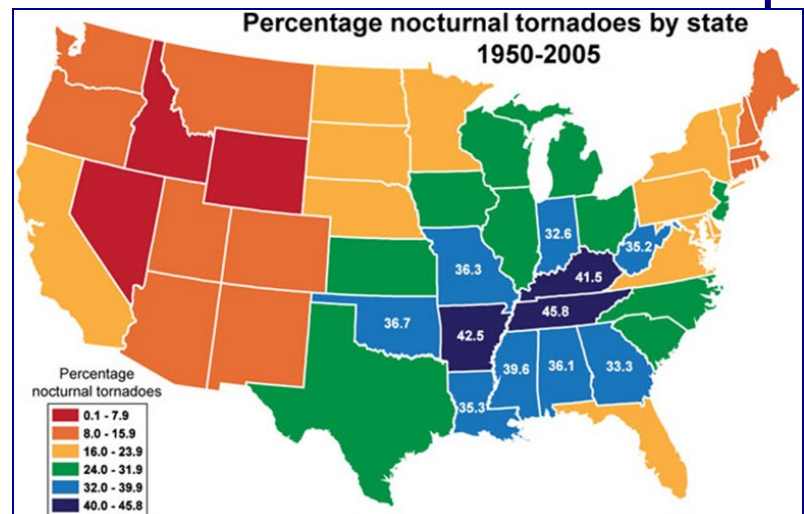
The National Weather Service produces the following important products that you need to familiarize yourself with:

**Hazardous Weather Outlook** - issued by the National Weather Service for the Tennessee Valley focusing on the potential weather hazards over the next seven days.

**Tornado/Severe Thunderstorm Watch** - issued by the Storm Prediction Center and the National Weather Service for a large portion of the region when conditions are favorable for tornado or severe thunderstorm development.

**Tornado/Severe Thunderstorm Warning** - issued by the National Weather Service for one or more counties when radar detects a tornado or a tornado has been spotted. Severe weather also includes hail 1" or larger or winds 58 mph or higher including wind damage.

Improved technology and better communication has helped forecasters issue earlier warnings with greater lead time over the past several years. However, warnings alone will NOT save lives unless people are prepared, keep informed, and take ACTION during severe weather. With the Tennessee Valley in a dangerous region for deadly tornadoes as the map below shows, it is not *if* we will have more devastating tornadoes, it's a question of *when*!!!



Both images are copyright of Walker Ashley, a professor at Northern Illinois University. As the top graphic shows, the state with the highest percentage of nocturnal (nighttime) tornadoes is Tennessee.

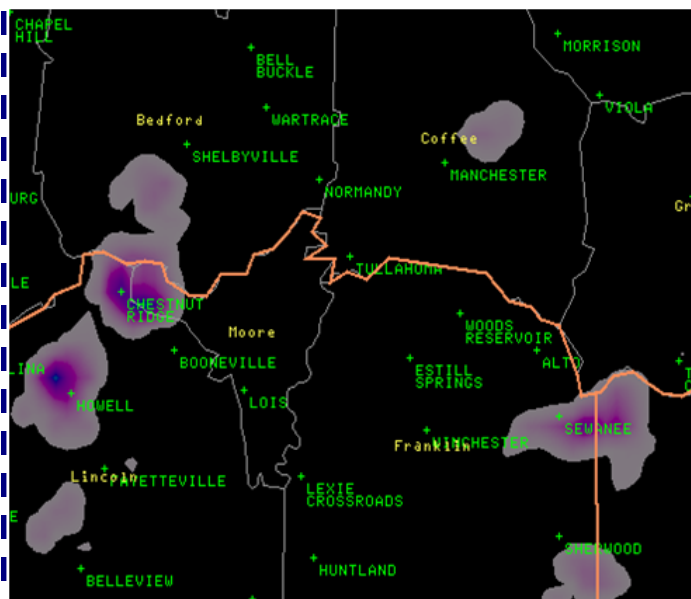
# The NASA-SPoRT Partnership

*Brian Carcione, Application Integration Meteorologist*

Collaboration with Huntsville's diverse meteorological community has been fundamental to the Huntsville NWS office since its establishment in 2002. In addition to being located on the University of Alabama in Huntsville campus, the office is also co-located with NASA's Short-term Prediction Research and Transition (SPoRT) Center. The SPoRT Center was also established in 2002, with a goal of transitioning various NASA earth science and meteorological data sets to the operational meteorology community, and especially to the National Weather Service.

help forecasters decide whether a tornado or severe thunderstorm warning is needed. While NASA-SPoRT is located in Huntsville and partners with NWS Huntsville, their collaborative efforts extend across the southern United States and beyond, including partnerships with NWS offices in Miami, Florida, Albuquerque, New Mexico, and even Great Falls, Montana!

To continue fostering this important partnership, NASA-SPoRT and the NWS recently established a new liaison position at NWS Huntsville called the Application Integration Meteorologist. The AIM's activities will center around operational research, software development, and forecasting, all of which will be dedicated to the NWS-SPoRT partnership. After spending the first eight years of my career at NWS Huntsville and seeing the SPoRT partnership first-hand, I was tremendously excited to be selected to become the first AIM in late May. In just a few short months, I have learned a great deal about what NASA-SPoRT can offer and how we can improve our forecasting and warning services as an office and as an agency. It's exciting to be an integral part of such a dynamic partnership!



*How LMA data is viewed on our computer systems over southern middle Tennessee.*

The close proximity of operational and research meteorologists resulted in a fruitful partnership that provides a wealth of additional information to NWS forecasters. Some of that information includes unique high-resolution satellite imagery, high-resolution computer model output, and total lightning information from the North Alabama Lightning Mapping Array (NALMA). The NALMA provides a complete picture of the total lightning within a thunderstorm rather than just the cloud-to-ground lightning strikes, and this can



*Brian Carcione poses for a picture in the operations area at the NWS in Huntsville.*



# NWS Huntsville and the Community

*Jennifer Lee, Forecaster*

One of the great things about working for the National Weather Service is the variety of work we enjoy. While our main duties are to protect life and property, it's also important that we spend time in the community doing

activities such as safety presentations and preparedness activities. Each month, there are generally several activities that we become involved with, and these range from weather safety presentations at local schools, to participation in large fairs such as Panoply, or preparedness days, such as a county's "Be Ready" Day.



*Forecasters Krissy Scotten and Sandy LaCorte take a break from the Panoply festivities.*

This spring and summer were no exception for the NWS in Huntsville! If you remember the Spring edition of Rocket City Weather, there was an article explaining our expected involvement with the Panoply Arts Festival in downtown Huntsville (April 23-25). As it turned out, Mother Nature had other things in mind that weekend across the Southeast, so not only was our office incredibly busy with warning operations and storm surveys, but we were also hosting a booth at the festival. Much like 2009, we were near the red bridge, and aside from all sorts of brochures and handouts, there were coloring activities for children and our F-5 tornado simulator! We also joined with the University of Alabama at Huntsville's Student American Meteorological Society to host an art contest for middle school children. The theme this year was "It's severe

weather time again: plan and prepare in 2010," and the winners were announced at the festival. All told, representatives from our office spoke with several thousand people that weekend, despite the treacherous weather on Saturday.

As Spring rolled into June, forecasters headed out to the Guntersville Airport for the Annual Splash In, a great event which featured local and regional aircraft. This was a really fun way for our office to branch into new territory—spending one on one time with our local aviation customers. All National Weather Service offices do aviation forecasts for designated airports within their area, and our office does forecasts for Huntsville International Airport and Northwest Alabama Regional Airport (in Muscle Shoals). These forecasts are used by commercial, military, and general aviation pilots alike, and attending the Splash In was an opportunity to speak with some of our general aviation customers.



*Forecaster Steve Shumway explains weather principles to a crowd in Winchester, TN during the May 2010 Dogwood Festival.*

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# NWS Huntsville and the Community

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July brought the Alabama All Star Sports Expo to town, and the NWS in Huntsville was there with a booth full of handouts and information for all the local and visiting coaches. The theme of the booth was lightning safety, as lightning awareness is incredibly important for any outdoor sports activity. Did you know that lightning can strike many miles away from the parent thunderstorm, so you can see blue sky overhead but still be struck by lightning? That's why we urge parents, coaches, and athletes to make the safe decision—head inside when there is lightning anywhere in the area.

Like I mentioned earlier, the NWS in Huntsville does many other types of community outreach, including weather presentations to local schools, community centers, and businesses. In June, we partnered with several libraries within Madison County to provide presentations on weather and weather safety, as well as scientific demonstrations from "Professor Weather." Professor Weather is one of our forecasters who assumes an academic persona to present weather experiments to school-aged groups. Some of the experiments include making a tornado in a bottle, demonstrating air pressure by sucking an egg into a bottle, and using a hair dryer with ping-pong balls to demonstrate how hail forms.

Professor Weather also traveled to many schools in Northern Alabama and Southern Middle Tennessee, with presentations for groups of all sizes and ages. According to Stephen Latimer, our education coordinator, meteorologists from our office spoke with 17 different schools between January and August!

Spring spotter talks continued into early summer as we tried to speak with as many civic organizations as

possible about severe weather safety and storm spotting. In fact, we added several hundred new spotters to our over-growing list of certified storm spotters. Our fall spotter talk season will kick-off shortly. While many presentations are already listed on our homepage ([www.weather.gov/Huntsville](http://www.weather.gov/Huntsville)), be sure to check back frequently as additional dates may still be added!

Interested in meeting up with of us? You'll be able to find us at many events this fall and winter. In October, we'll head into Tennessee to host a booth at the Jack Daniels Barbeque Festival. We have participated in the event for many years now, and each fall it's always a treat (literally!).

We have also already scheduled many presentations for the fall semester at local schools. If you are an educator, and are interested in having someone from our office come to your classroom to speak about weather and weather safety, please contact Stephen Latimer ([Stephen.Latimer@noaa.gov](mailto:Stephen.Latimer@noaa.gov)) and he will be happy to set something up!

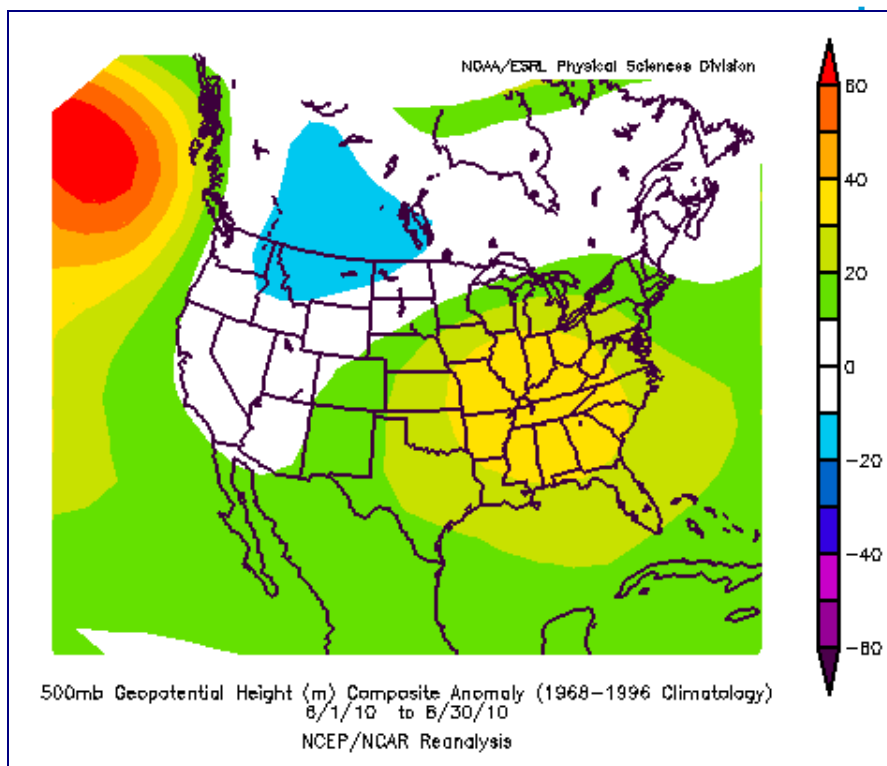


*Forecaster Sandy LaCorte gives a weather safety and awareness presentation to a group of school children in the NWS Huntsville conference room.*

# The Long Hot Summer of 2010

*Kris White, Forecaster*

The summer of 2010 ended as the warmest on record for both the Huntsville area and Muscle Shoals. Now, before we get further into this discussion, let's first distinguish between meteorological summer and astronomical summer. Meteorological summer is defined simply as the June through August period, or what are commonly the warmest months in this region of the country. Astronomical summer, meanwhile, is the season defined strictly by the Earth-Sun relationship, which begins with the summer solstice and ends with the autumnal equinox. It's far too early to state whether the current astronomical summer will likewise end as the warmest on record, with a few weeks still to go. However, at the time of this writing, it is the warmest on record thus far. So, we'll just have to wait and see.



So, what has made this summer so warm? Well, several factors were probably at play, among them, the occurrence of an unusually strong and persistent ridge of high pressure aloft over the eastern United States, and the presence of a moisture-laden, tropical maritime airmass over the Tennessee Valley region. The graphic on the top right is a reanalysis of anomalous 500 millibar geopotential heights for parts of North America for the June 1<sup>st</sup> through August 30<sup>th</sup> period (the latest dates currently available). The portions of the map shaded with the green, yellow, and red colors denote areas where heights were above normal during this period, or basically, where high pressure aloft was stronger and more persistent than normal. Notice that a strong positive anomaly was centered directly over the Tennessee and lower Ohio Valleys. It was this unusually persistent high pressure centered over the eastern United States that kept the

storm track well to the north, not allowing cooler airmasses, or significant cooling rains to enter the area.

Another reason for the above normal temperatures was the presence of a very moist airmass across the region. This moisture-laden air did not allow temperatures to decrease much during the nighttime hours. The result was much above normal overnight low temperatures and the longest streak of low temperatures above 70 degrees (F) on record at Huntsville and Muscle Shoals (49 days). In fact, this streak shattered the previous record streaks of 36 days at Huntsville, set in 1969, and 31 days at the Shoals, set in 1954. During two days in August, the low temperature only fell to a balmy 79 degrees at Huntsville, setting a new all-time record high minimum temperature for the month. On one of those days, August 4<sup>th</sup>, the high temperature was 103 degrees. The resulting average daily temperature of 91 degrees at

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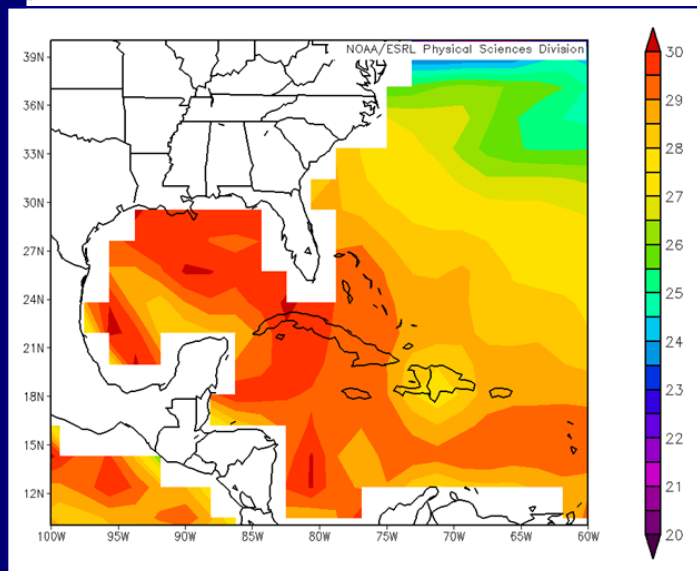


# The Long Hot Summer of 2010

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Huntsville was the warmest day since July 15<sup>th</sup> 1954. While only a few daytime record high temperatures

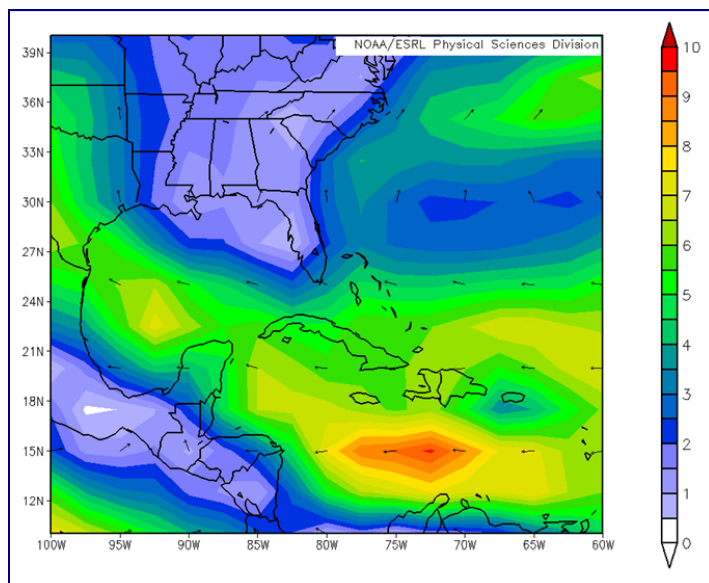
southern United States, as shown in the graphic below. With the high dew point temperatures in place, the nearly persistent ridge of high pressure overhead and the



*Average sea surface temperatures for June-August 2010*

were set, the high humidity combined with daytime temperatures in the mid 90s to around 100 degrees to produce heat index temperatures over 110 degrees on some days. These were among the warmest heat index temperatures in over 40 years to occur across the area.

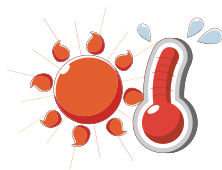
So, what caused the very humid airmass to develop and remain over the region? Well, several factors may have been at play. However, the most likely culprit appears to be a combination of above normal sea surface temperatures in the Gulf of Mexico (GOM) and the persistent ridge of high pressure aloft. First, reanalysis (pictured above) shows that sea surface temperatures in the GOM averaged around 29°C to 30°C, which is about 1.0 Celsius above normal. For the June to August period, low-level winds were fairly persistent from the southeast across the Caribbean, blowing into the Gulf and the southeast United States. This transferred rich moisture from the deep tropics and the Gulf into the



*This graphic shows the transfer of rich gulf moisture (as indicated by the arrows) into the Southeast.*

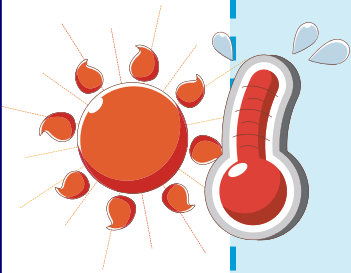
main storm track well to our north, tropical moisture remained in place over a large portion of the eastern United States for a long period of time. This kept overnight low temperatures very warm. Although other factors probably were at work during the season, these would appear to be the primary reasons for the very warm temperatures experienced during this summer.

So, where will temperatures go from here? Well, temperatures for the fall season are actually a little hard to call at this point. But, if the developing La Niña is any guide, temperatures are most likely to average above normal for the winter season.



# Summer Temperature Records

*June 1—August 31*



Huntsville		Muscle Shoals	
Rank	Temp (Year)	Rank	Temp (Year)
1	<b>83.5 (2010)</b>	1	<b>82.6 (2010)</b>
2	82.0 (1952)	1 (tie)	82.5 (1980)
3	81.5 (2007)	3	82.4 (1943)
4	81.3 (1914)	4	82.0 (1952)
4 (tie)	81.3 (1921)	5	81.5 (1934)
4 (tie)	81.3 (1954)	5 (tie)	81.5 (2007)
7	81.1 (1925)	7	81.2 (1993)
7 (tie)	81.1 (1936)	8	81.0 (1899)
9	81.0 (2006)	8 (tie)	81.0 (1925)
10	80.9 (1934)	10	80.8 (2006)

## New Staff Additions

Christina Crowe was recently promoted to the position of a general forecaster from the NWS Office in Springfield, Missouri. A native of Missouri and graduate of the University of Missouri in Columbia, Christina enjoyed her short time back in the Midwest, but she is excited to be returning to Huntsville where she completed her Masters Degree at the University of Alabama in Huntsville and researched tornadoes associated with landfalling hurricanes. Christina enjoys studying all kinds of weather including tornadoes, thundersnow, and hurricanes; but originally got into weather in the 4th grade when she read the book 'The Night of the Twisters.' She looks forward to serving the Tennessee Valley again and getting back to good barbeque!

*Welcome, Christina!*



*We snapped this picture of Christina at her NWS Huntsville going away party last year. We're glad she's back with us!*



# Contact Information

*The NWS in Huntsville: Serving Northern Alabama and Southern Middle Tennessee*

National Weather Service  
Huntsville, Alabama

320A Sparkman Dr NW  
Huntsville, AL 35805

Phone: 256-890-8503

Fax: 256-890-8513

[www.weather.gov/Huntsville](http://www.weather.gov/Huntsville)

Webmaster's Email Address:  
[sr-hun.webmaster@noaa.gov](mailto:sr-hun.webmaster@noaa.gov)

Spotter Email Address:  
[sr-hun.spotter@noaa.gov](mailto:sr-hun.spotter@noaa.gov)

## Reporting Weather

**There are several ways to report hazardous weather conditions such as hail, wind damage, funnel clouds, tornadoes, exceptionally heavy rainfall or flash flooding:**

1. **Call the office at 256-890-8503**
2. **Submit your report online**
3. **After the event, email pictures to:**  
**[SR-HUN.Spotter@noaa.gov](mailto:SR-HUN.Spotter@noaa.gov)**

**Timely reports can save lives!**

## Rocket City Weather Fest

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Research and Transition Center (SPoRT/NASA) and Baron Services, this event will give the atmospheric and related sciences community an opportunity to educate the public on weather-related phenomena, emphasizing on safety and preparedness, and to showcase scientific research taking place here in Huntsville, AL. From hands-on activities and demonstrations, kids' games and crafts to a Skywarn Spotter training and other informative seminars, this fun-filled event will be perfect for the entire family!

To learn more about Rocket City Weather Fest, visit  
[www.rocketcityweatherfest.com](http://www.rocketcityweatherfest.com)

## Rocket City Weather

*Volume I, Issue II*

Contributors  
*Brian Carcione*  
*Jennifer Lee*  
*Krissy Scotten*  
*Sandy LaCorte*  
*Kris White*

Layout Editor  
*Sandy LaCorte*

Editor-In-Chief  
*Jennifer Lee*  
[Jennifer.L.Lee@noaa.gov](mailto:Jennifer.L.Lee@noaa.gov)

Meteorologist-In-Charge  
*Michael Coyne*  
[Mike.Coyne@noaa.gov](mailto:Mike.Coyne@noaa.gov)

